this part. Class 300 raised face steel flanges may be bolted to class 250 raised face cast iron flanges with bolting in accordance with §56.25–20(b) of this part.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 77–140, 54 FR 40605, Oct. 2, 1989]

§56.25–15 Gaskets (reproduces 108.4).

(a) Gaskets shall be made of materials which are not injuriously affected by the fluid or by temperature.

(b) Only metallic and suitable asbestos-free nonmetallic gaskets may be used on flat or raised face flanges if the expected normal operating pressure exceeds 720 pounds per square inch or the operating temperature exceeds 750 °F.

(c) The use of metal and nonmetallic gaskets is not limited as to pressure provided the gasket materials are suitable for the maximum fluid temperatures.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 86–035, 54 FR 36316, Sept. 1, 1989]

§56.25–20 Bolting.

(a) *General.* (1) Bolts, studs, nuts, and washers must comply with applicable standards and specifications listed in §56.60–1 of this part. Unless otherwise specified, bolting must be in accordance with ANSI B16.5.

(2) Bolts and studs must extend completely through the nuts.

(3) See §58.30–15(c) of this chapter for exceptions on bolting used in fluid power and control systems.

(b) Carbon steel bolts or bolt studs may be used if expected normal operating pressure does not exceed 300 pounds per square inch gage and the expected normal operating temperature does not exceed 400 °F. Carbon steel bolts must have heavy hexagon heads in accordance with ANSI B18.2.1 and must have heavy semifinished hexagonal nuts in accordance with ANSI B18.2.2, unless the bolts are tightly fitted to the holes and flange stress calculations taking the bolt bending stresses into account are submitted. When class 250 cast iron flanges are used or when class 125 cast iron flanges are used with ring gaskets, the bolting material must be carbon steel conforming to ASTM Specification A307, Grade B.

(c) Alloy steel stud bolts must be threaded full length or, if desired, may have reduced shanks of a diameter not less than that at the root of the threads. They must have heavy semifinished hexagonal nuts in accordance with ANSI B18.2.2.

(d) All alloy bolts or bolt studs and accompanying nuts are recommended to be threaded in accordance with ANSI B1.1, Class 2A external threads, and Class 2B internal threads (8-thread series 8UN for 1 inch and larger).

(e) (Reproduces 108.5.6.) Washers, when used under nuts, shall be of forged or rolled steel.

[CGFR 68–82, 33 FR 18843, Dec.18, 1968, as amended by CGD 77–140, 54 FR 40605, Oct. 2, 1989]

Subpart 56.30—Selection and Limitations of Piping Joints

§56.30–1 Scope (replaces 110 through 118).

(a) The selection and limitation of piping joints shall be as required by this subpart in lieu of requirements in 110 through 118 of ANSI–B31.1; however certain requirements are marked ''reproduced'' in this subpart.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9978, June 17, 1970]

§56.30–3 Piping joints (reproduces 110).

The type of piping joint used shall be suitable for the design conditions and shall be selected with consideration of joint tightness, mechanical strength and the nature of the fluid handled.

§56.30–5 Welded joints.

(a) *General.* Welded joints may be used for materials for which welding procedures, welders, and welding machine operators have been qualified in accordance with part 57 of this subchapter.

(b) *Butt welds—general.* Butt welds may be made with or without backing or insert rings within the limitations established in §56.70–15. When the use of backing rings will result in undesirable conditions such as severe stress concentrations, corrosion or erosion, then: